



# Kidney Failure CHOOSING A TREATMENT THAT'S RIGHT FOR YOU



U.S. Department  
of Health and  
Human Services



NATIONAL INSTITUTES OF HEALTH  
National Kidney and Urologic Diseases  
Information Clearinghouse

Kidney Failure

# CHOOSING A TREATMENT THAT'S RIGHT FOR YOU



NATIONAL INSTITUTES OF HEALTH  
National Institute of Diabetes and Digestive and Kidney Diseases



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## Introduction

Your kidneys filter wastes from your blood and regulate other functions of your body. When your kidneys fail, you need treatment to replace the work your kidneys normally perform.

Developing kidney failure means that you have some decisions to make about your treatment. If you choose to receive treatment, your choices are hemodialysis, which requires a machine used to filter your blood outside your body; peritoneal dialysis, which uses the lining of your belly to filter your blood inside the body; and kidney transplantation, in which a new kidney is placed in your body. Each of them has advantages and disadvantages. You may also choose to forgo treatment. By learning about your choices, you can work with your doctor to decide what's best for you. No matter which treatment you choose, you'll need to make some changes in your life, including how you eat and plan your activities. But with the help of your health care team, family, and friends, you can lead a full, active life.



## When Your Kidneys Fail

Healthy kidneys clean your blood by removing excess fluid, minerals, and wastes. They also make hormones that keep your bones strong and your blood healthy. When your kidneys fail, harmful wastes build up in your body, your blood pressure may rise, and your body may retain excess fluid and not make enough red blood cells. When this happens, you need treatment to replace the work of your failed kidneys.

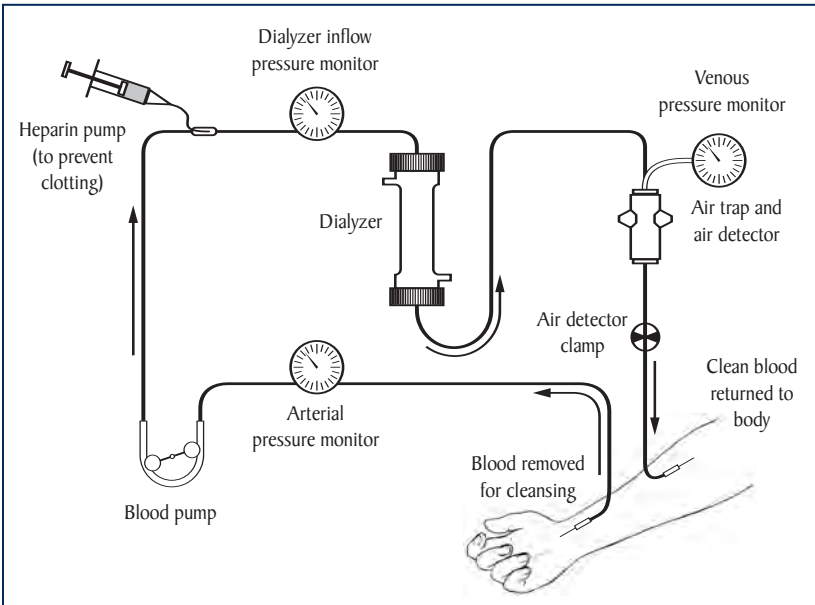
# Treatment Choice: Hemodialysis

## Purpose

Hemodialysis cleans and filters your blood using a machine to temporarily rid your body of harmful wastes, extra salt, and extra water. Hemodialysis helps control blood pressure and helps your body keep the proper balance of important chemicals such as potassium, sodium, calcium, and bicarbonate.

## How It Works

Hemodialysis uses a special filter called a dialyzer that functions as an artificial kidney to clean your blood. During treatment, your blood travels through tubes into the dialyzer, which filters out wastes and extra water. Then the cleaned blood flows through another set of tubes back into your body. The dialyzer is connected to a machine that monitors blood flow and removes wastes from the blood.



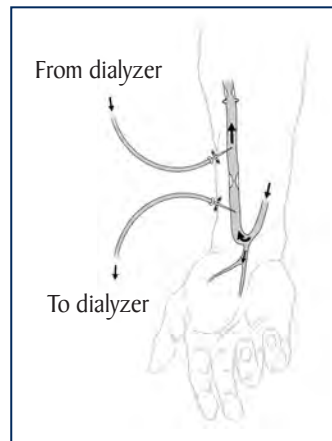
Hemodialysis.

Hemodialysis is usually needed three times a week. Each treatment lasts from 3 to 5 or more hours. During treatment, you can read, write, sleep, talk, or watch TV.

## Getting Ready

If you choose hemodialysis, several months before your first treatment, an access to your bloodstream will need to be created. You may need to stay overnight in the hospital, but many patients have their access placed on an outpatient basis. This access provides an efficient way for blood to be carried from your body to the dialyzer and back without causing discomfort. The two main types of access are a fistula and a graft.

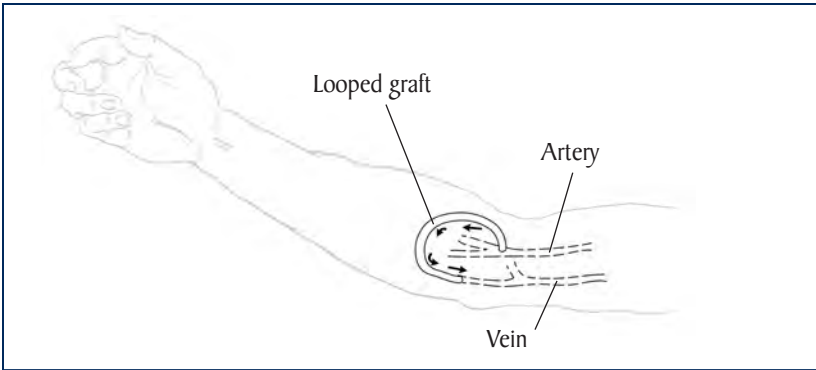
- A surgeon makes a fistula by using your own blood vessels; an artery is connected directly to a vein, usually in your forearm. The increased blood flow makes the vein grow larger and stronger so that it can be used for repeated needle insertions. This kind of access is the preferred type. It may take several weeks to be ready for use.



Arteriovenous fistula.

- A graft connects an artery to a vein by using a synthetic tube. It doesn't need to develop as a fistula does, so it can be used sooner after placement. But a graft is more likely to have problems with infection and clotting.

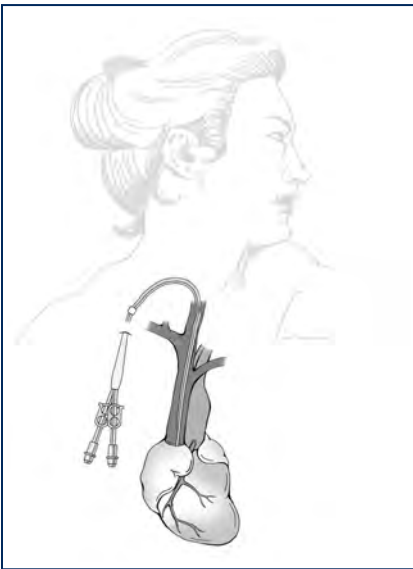
Before dialysis, needles are placed into the access to draw out the blood. You'll be given a local anesthetic to minimize any pain.



Graft.

If your kidney disease has progressed quickly, you may not have time to get a permanent vascular access before you start hemodialysis treatments. You may need to use a catheter—a tube inserted into a vein in your neck, chest, or leg near the groin—as a temporary access. Some people use a catheter for long-term access as well. Catheters that will be needed for

more than about 3 weeks are designed to be placed under the skin to increase comfort and reduce complications.



Catheter for temporary access.

For more information about vascular access, see the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) fact sheet *Vascular Access for Hemodialysis*.

## Who Performs It

Hemodialysis is usually done in a dialysis center by nurses and trained technicians. In some parts of the country, certain centers are available to offer the training and support for home hemodialysis, which requires the help of a partner, usually a family member or friend, and sufficient space and water supply in the home. If you decide to do home dialysis, you and your partner will receive special training. As home hemodialysis machines become more convenient and the support more available, home hemodialysis may be an option across the country.

## Possible Complications

Vascular access problems are the most common reason for hospitalization among people on hemodialysis. Common problems include infection, blockage from clotting, and poor blood flow. These problems can keep your treatments from working. You may need to undergo repeated surgeries in order to get a properly functioning access.

Other problems can be caused by rapid changes in your body's water and chemical balance during treatment. Muscle cramps and hypotension—a sudden drop in blood pressure—are two common side effects. Hypotension can make you feel weak, dizzy, or sick to your stomach.

You'll probably need a few months to adjust to hemodialysis. Side effects can often be treated quickly and easily, so you should always report them to your doctor and dialysis staff. You can avoid many side effects if you follow a proper diet, limit your liquid intake, and take your medicines as directed.

## Diet for Hemodialysis

Hemodialysis and a proper diet help reduce the wastes that build up in your blood. A dietitian is available at all dialysis centers to help you plan meals according to your doctor's orders. When choosing foods, remember to

- eat balanced amounts of high-protein foods such as meat, chicken, and fish.
- control the amount of potassium you eat. Potassium is a mineral found in salt substitutes, some fruits (bananas, oranges), vegetables, chocolate, and nuts. **Too much potassium can be dangerous to your heart.**
- limit how much you drink. When your kidneys aren't working, water builds up quickly in your body. Too much liquid makes your tissues swell and can lead to high blood pressure, heart trouble, and cramps and low blood pressure during dialysis.
- avoid salt. Salty foods make you thirsty and make your body hold water.
- limit foods such as milk, cheese, nuts, dried beans, and dark colas. These foods contain large amounts of the mineral phosphorus. Too much phosphorus in your blood causes calcium to be pulled from your bones, which makes them weak and brittle and can cause arthritis. To prevent bone problems, your doctor may give you special medicines, which you must take with meals every day as directed.

For more information about choosing the right foods, see the NIDDK booklet *Eat Right to Feel Right on Hemodialysis*.

## Pros and Cons

Each person responds differently to similar situations. What may be a negative factor for one person may be positive for another. See a list of the general advantages and disadvantages of in-center and home hemodialysis on the next page.

## ————— In-Center Hemodialysis —————

### Pros

- + Facilities are widely available.
- + You have trained professionals with you at all times.
- + You can get to know other patients.

### Cons

- Treatments are scheduled by the center and are relatively fixed.
- You must travel to the center for treatment.

## ————— Home Hemodialysis —————

### Pros

- + You can do it at the times you choose—but you still must do it as often as your doctor orders.
- + You don't have to travel to a center.
- + You gain a sense of independence and control over your treatment.
- + Newer machines require less space.

### Cons

- You must have a helper.
- Helping with treatments may be stressful to your family.
- You and your helper need training.
- You need space for storing the machine and supplies at home.

## Working With Your Health Care Team

Questions you may want to ask:

- Is hemodialysis the best treatment choice for me? Why?
- If I'm treated at a center, can I go to the center of my choice?
- What should I look for in a dialysis center?
- Will my kidney doctor see me at dialysis?
- What does hemodialysis feel like?
- What is self-care dialysis?
- Is home hemodialysis available in my area? How long does it take to learn? Who will train my partner and me?
- What kind of blood access is best for me?
- As a hemodialysis patient, will I be able to keep working? Can I have treatments at night?
- How much should I exercise?
- Who will be on my health care team? How can these people help me?
- With whom can I talk about finances, sexuality, or family concerns?
- How/where can I talk with other people who have faced this decision?

For more information about hemodialysis, see the NIDDK booklet *Treatment Methods for Kidney Failure: Hemodialysis*. Or see the chart on pages 20 and 21 that summarizes three treatment options.

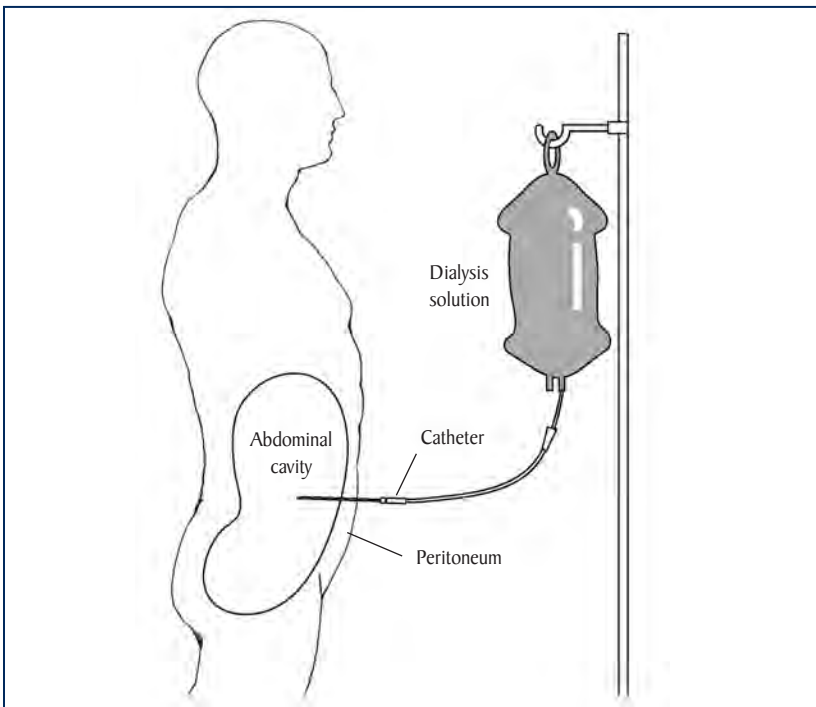
## Treatment Choice: Peritoneal Dialysis

### Purpose

Peritoneal dialysis is another procedure that removes extra water, wastes, and chemicals from your body. This type of dialysis uses the lining of your abdomen, or belly, to filter your blood. This lining is called the peritoneal membrane and acts as the artificial kidney.

### How It Works

A mixture of minerals and sugar dissolved in water, called dialysis solution, travels through a soft tube into your belly. The sugar—called dextrose—draws wastes, chemicals, and extra water from the tiny blood vessels in your peritoneal



Peritoneal dialysis.

membrane into the dialysis solution. After several hours, the used solution is drained from your abdomen through the tube, taking the wastes from your blood with it. Then you fill your abdomen with fresh dialysis solution, and the cycle is repeated. The process of draining and refilling is called an exchange.

## Getting Ready

Before your first treatment, a surgeon places a small, soft tube called a catheter into your abdomen. The catheter tends to work better if there is adequate time—usually from 10 days to 2 or 3 weeks—for the insertion site to heal. Planning your dialysis access can improve treatment success. This catheter stays there permanently to help transport the dialysis solution to and from your abdomen.

## Types of Peritoneal Dialysis

Three types of peritoneal dialysis are available.

- 1. Continuous Ambulatory Peritoneal Dialysis (CAPD)**

CAPD requires no machine and can be done in any clean, well-lit place. With CAPD, your blood is always being cleaned. The dialysis solution passes from a plastic bag through the catheter and into your abdomen, where it stays for several hours with the catheter sealed. The time period that dialysis solution is in your abdomen is called the dwell time. Next, you drain the dialysis solution into an empty bag for disposal. You then refill your abdomen with fresh dialysis solution so the cleaning process can begin again. With CAPD, the dialysis solution stays in your abdomen for a dwell time of 4 to 6 hours, or more. The process of draining the used dialysis solution and replacing it with fresh solution takes about 30 to 40 minutes. Most people

change the dialysis solution at least four times a day and sleep with solution in their abdomens at night. With CAPD, it's not necessary to wake up and perform dialysis tasks during the night.

**2. Continuous Cycler-Assisted Peritoneal Dialysis (CCPD)**

CCPD uses a machine called a cycler to fill and empty your abdomen three to five times during the night while you sleep. In the morning, you begin one exchange with a dwell time that lasts the entire day. You may do an additional exchange in the middle of the afternoon without the cycler to increase the amount of waste removed and to reduce the amount of fluid left behind in your body.

**3. Combination of CAPD and CCPD**

If you weigh more than 175 pounds or if your peritoneum filters wastes slowly, you may need a combination of CAPD and CCPD to get the right dialysis dose. For example, some people use a cycler at night but also perform one exchange during the day. Others do four exchanges during the day and use a minicycler to perform one or more exchanges during the night. You'll work with your health care team to determine the best schedule for you.

## Who Performs It

Both types of peritoneal dialysis are usually performed by the patient without help from a partner. CAPD is a form of self-treatment that needs no machine. However, with CCPD, you need a machine to drain and refill your abdomen.

## Possible Complications

The most common problem with peritoneal dialysis is peritonitis, a serious abdominal infection. This infection can occur if the opening where the catheter enters your body becomes infected or if contamination occurs as the catheter is connected or disconnected from the bags. Peritonitis requires antibiotic treatment by your doctor.

To avoid peritonitis, you must be careful to follow procedures exactly and learn to recognize the early signs of peritonitis, which include fever, unusual color or cloudiness of the used fluid, and redness or pain around the catheter. Report these signs to your doctor immediately so that peritonitis can be treated quickly to avoid serious problems.

## Diet for Peritoneal Dialysis

A peritoneal dialysis diet is slightly different from a hemodialysis diet.

- You'll still need to limit salt and liquids, but you may be able to have more of each, compared with hemodialysis.
- You must eat more protein.
- You may have different restrictions on potassium.
- You may need to cut back on the number of calories you eat because there are calories in the dialysis fluid that may cause you to gain weight.

Your doctor and a dietitian who specializes in helping people with kidney failure will be able to help you plan your meals.

## Pros and Cons

Each type of peritoneal dialysis has advantages and disadvantages.

## Peritoneal Dialysis

### CAPD

#### Pros

- + You can do it alone.
- + You can do it at times you choose as long as you perform the required number of exchanges each day.
- + You can do it in many locations.
- + You don't need a machine.

#### Cons

- It can disrupt your daily schedule.
- It is a continuous treatment, and all exchanges must be performed 7 days a week.

### CCPD

#### Pros

- + You can do it at night, mainly while you sleep.
- + You are free from exchanges during the day.

#### Cons

- You need a machine.
- Your movement at night is limited by your connection to the cyclor.

## Working With Your Health Care Team

Questions you may want to ask:

- Is peritoneal dialysis the best treatment choice for me? Why? If yes, which type is best?
- How long will it take me to learn how to do peritoneal dialysis?
- What does peritoneal dialysis feel like?
- How will peritoneal dialysis affect my blood pressure?
- How will I know if I have peritonitis? How is it treated?
- As a peritoneal dialysis patient, will I be able to continue working?
- How much should I exercise?
- Where do I store supplies?
- How often do I see my doctor?
- Who will be on my health care team? How can these people help me?
- Whom do I contact with problems?
- With whom can I talk about finances, sexuality, or family concerns?
- How/where can I talk with other people who have faced this decision?

For more information about peritoneal dialysis, see the NIDDK booklet *Treatment Methods for Kidney Failure: Peritoneal Dialysis*. Or see the chart on pages 20 and 21 that summarizes three treatment options.

## Dialysis Is Not a Cure

Hemodialysis and peritoneal dialysis are treatments that help replace the work your kidneys did. These treatments help you feel better and live longer, but they don't cure kidney failure. Although patients with kidney failure are now living longer than ever, over the years kidney disease can cause problems such as heart disease, bone disease, arthritis, nerve damage, infertility, and malnutrition. These problems won't go away with dialysis, but doctors now have new and better ways to prevent or treat them. You should discuss these complications and treatments with your doctor.

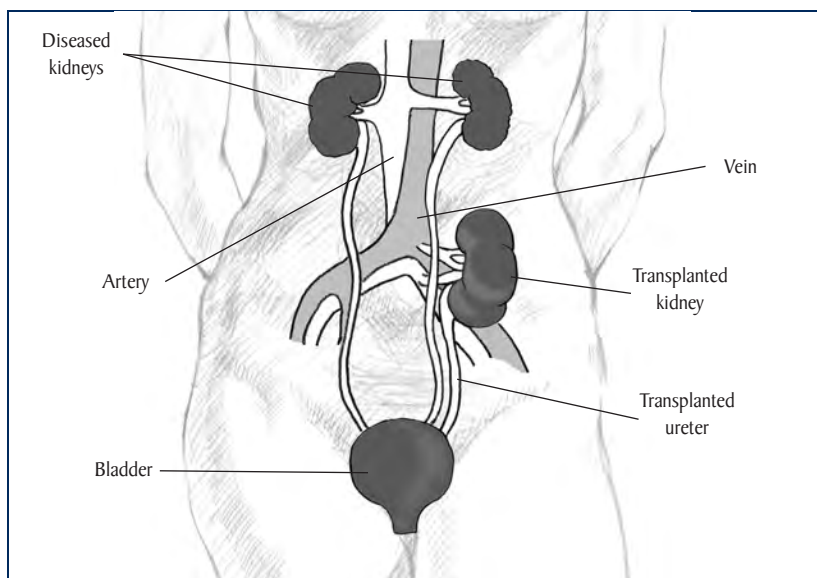
## Treatment Choice: Kidney Transplantation

### Purpose

Kidney transplantation surgically places a healthy kidney from another person into your body. The donated kidney does the work that your two failed kidneys used to do.

### How It Works

A surgeon places the new kidney inside your lower abdomen and connects the artery and vein of the new kidney to your artery and vein. Your blood flows through the donated kidney, which makes urine, just like your own kidneys did when they were healthy. The new kidney may start working right away or may take up to a few weeks to make urine. Unless your own kidneys are causing infection or high blood pressure, they are left in place.



Kidney transplantation.

## Getting Ready

The transplantation process has many steps. First, talk with your doctor, because transplantation isn't for everyone. Your doctor may tell you that you have a condition that would make transplantation dangerous or unlikely to succeed.

You may receive a kidney from a deceased donor—a person who has recently died—or from a living donor. A living donor may be related or unrelated—usually a spouse or a friend. If you don't have a living donor, you're placed on a waiting list for a deceased donor kidney. The wait for a deceased donor kidney can be several years.

The transplant team considers three factors in matching kidneys with potential recipients. These factors help predict whether your body's immune system will accept the new kidney or reject it.































